National Nanomanufacturing Network Newsletter

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The NNN Newsletter

Integrated Systems Nanomanufacturing: Challenges for Next Generation Nano-Enabled Products

The emerging capabilities of nanotechnology for systematic control and manufacturing across multiple length scales are evolving into the next generation of nanotechnology products. These products can be categorized as passive nanostructures, active nanostructures, multi-dimensional nanosystems, heterogeneous molecular nanosystems, and multiscale, integrated nanosystems. An improved understanding of interactive forces among nanostructures and materials, along with their collective behavior within integrated systems, enables the development of new methods to control and manipulate nanocomponents and hierarchical structures.

This improved understanding will become a central research topic for discoveries and innovations toward new commercial applications, as well as new paradigms in the manufacturing sciences that address the necessary economy of scale requirements for these new products. Integrated systems nanomanufacturing must combine the knowledge that has evolved to achieve this controlled manipulation of materials and structures with emerging capabilities and methodologies to realize next generation systems.

More...

Regards,
Jeff Morse, Managing Director,
National Nanomanufacturing Network

Learn more about the NNN...

Gram-scale Production of Graphene

Graphene--the two-dimensional sheet form of carbon--exhibits remarkable properties, including an electron mobility in excess of 200,000 cm2V-1s-1, suggesting promising applications in electronics, energy, sensors, composites and more. However, most previous work has produced graphene from bulk highly-oriented pyrolitic graphite by micromechanical cleavage or other “delamination” methods, quite typically producing small quantities. The

Upcoming Events

January 27 - 30, 2009
Symposium on Surface and Nanoscience

January 29, 2009
2nd Annual Massachusetts Nanotechnology Workshop

February, 18 - 19, 2009
Nanotechnology Law, Regulation and Policy

February 22 - 27, 2009
SPIE Advanced Lithography

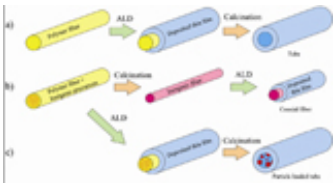
Affiliated Centers

ability to produce large quantities of graphene from nongraphitic precursors with a scalable, low-cost approach is a significant step towards real-world applications of graphene. More...

Best Practices for Working with Nanoparticles

Drs. Michael Ellenbecker and Candace Tsai of the University of Massachusetts Lowell have authored a working document, *Interim Best Practices for Working with Nanoparticles*, for use at the NSF Center for High-rate Nanomanufacturing (CHN). This document, available for download on InterNano, will be discussed at the upcoming 2nd Annual Massachusetts Nanotechnology Workshop in Boston, MA, on January 29. More...

Controlled Nanomanufacturing of Magnetic Composite Nanofibers



Magnetic composites in the form of nanoparticles and nanofibers have attracted significant attention recently for potential applications including electrochemical biosensing, bioseparation, the detection of DNA, RNA, cells and proteins, and controlled drug and gene delivery. Santala, et. al., report a versatile method for preparing magnetic and photocatalytic nanofibers by combining electrospinning and atomic layer deposition (ALD) to control both the materials composition of the nanofiber and the specific structure and dimensions of the resulting fibers. More...

Read more on InterNano

CHM Center for Hierarchical Manufacturing University of Massachusetts Amherst

Center for High-rate Nanomanufacturing

Center for Nanoscale Chemical-Electrical-Mechanical Manufacturing Systems

SINAM CENTER FOR SCALABLE AND INTEGRATED NANOMANUFACTURING

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